

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A scalable system for providing real time communication services between user devices, the scalable system comprising:
 - ~~at least one~~ a call control element (CCE) providing system call control functions;
 - a scalable border element (BE) providing scalable system interface functions and in communication with the call control element said CCE;
 - a first user device for initiating a call and in communication with said the scalable border element BE; and
 - a second user device acting as a call destination device and in communication with said the scalable border element BE, wherein the scalable border element comprises:
 - a BE border element signaling entity providing BE border element signaling functions and in communication with the call control element said CCE;
 - a first BE border element media entity providing BE border element media functions in communication with said ~~BE~~ the border element signaling entity and in communication with said the first user device for initiating [[a]] the call; and
 - a second BE border element media entity providing BE border element media functions in communication with said ~~BE~~ the border element signaling entity, in communication with said the first BE border element media entity for media transfers and in communication with [[a]] the second user device acting as [[a]] the call destination device.
2. (Currently Amended) The scalable system of claim 1 wherein the ~~scalable border element (BE) providing scalable system interface functions~~ comprise further comprises:

signaling functions including call setup signaling functions;
media control functions including transcoding functions;
security functions including firewall and encryption and decryption
functions; and
call admission control functions including call authentication functions.

3. (Canceled)

4. (Currently Amended) The scalable system of claim 1 wherein the BE border element signaling functions comprise ~~further comprises~~:

user agent functions;
proxy functions; and
back to back user agent functions.

5. (Currently Amended) The scalable system of claim 1 wherein the BE border element media functions comprise ~~further comprises~~:

dual tone multi-frequency (DTMF) digit detection;
real time protocol (RTP) re-origination;
~~firewall/NAT~~ firewall and network address translation functions; and
media transcoding functions.

6. (Currently Amended) The scalable system of claim 5 further comprising ~~comprises~~:

at least one an application server (AS) providing at least one a scalable system service function and in communication with the call control element said CCE.

7. (Currently Amended) The scalable system of claim 1 wherein the communication ~~with said CCE~~ between the scalable border element and the call control element uses a session initiation protocol (SIP).

8. (Currently Amended) The scalable system of claim 1 wherein the ~~said communication with the BE~~ between the border element signaling entity and the first border element media entity is a master/slave protocol where the BE border element signaling entity acts as the a master and the BE first border element media entity acts as the a slave.

9. (Currently Amended) The scalable system of claim 1, wherein further comprises:

said the first BE border element media entity and said the second BE border element media entity are located physically apart from each other and in closer proximity to said the first and second user devices than to said BE the border element signaling entity; and

wherein a call being placed between the said first and second user devices comprising comprises signaling messages and media transfers, wherein [[the]] a timing threshold for the signaling messages is less than a few seconds and the timing threshold for the media transfers is less than approximately 300 milliseconds milliseconds or a value not to exceed the perceptible limit of naturalness of interactive human communication.

10. (Currently Amended) The scalable system of claim 6 wherein upon a detection of a dual tone multiple frequency digit DTMF digit is detected by one of the first and second the BE border element media entities entity the BE one of the first and second border element media entities entity notifies the BE border element signaling entity of DTMF the dual tone multiple frequency digit detection, and the border element signaling entity detection which notifies the AS application server of the dual tone multiple frequency digit detection event over a separate signaling path.

11. (Currently Amended) The scalable system of claim 1 further comprising comprises:

a call admission control (CAC) entity in communication with said the scalable BE border element and in communication with the call control element ~~said CCE~~;

a media server (MS) entity in communication with the call control element ~~said CCE~~;

a service broker (SB) entity in communication with the call control element ~~said CCE~~; and

a network routing engine (NRE) in communication with the call control element ~~said CCE~~.

12. (Currently Amended) The scalable system of claim 1 wherein the scalable border element further comprises:

a first BE border element firewall/network address translation (FW/NAT) entity providing BE FW/NAT border element firewall and network address translation functions in communication with ~~said~~ the first BE border element media entity and in communication with ~~said the~~ first user device for initiating a call; and

a second BE border element firewall/network address translation (FW/NAT) entity providing BE FW/NAT border element firewall and network address translation functions in communication with ~~said the~~ second BE border element media entity and in communication with ~~said the~~ second user device acting as a call destination device.

13. (Currently Amended) The scalable system of claim 12 wherein the BE border element media functions comprise ~~further comprises~~:

dual tone multi-frequency (DTMF) digit detection;
real time protocol (RTP) re-origination; and
media transcoding functions.

14. (Currently Amended) The scalable system of claim 12 wherein the scalable border element further comprises:

at least one a media transcoding entity providing ~~BE~~ border element media transcoding functions.

15. (Currently Amended) The scalable system of claim 14 wherein the ~~BE~~ border element media functions comprise ~~further comprises~~:

dual tone multi-frequency (~~DTMF~~) digit detection; and
real time protocol (~~RTP~~) re-origination.

16. (Currently Amended) A method of connecting a call between user devices comprising:

connecting a first user device ~~for initiating a call~~ to a scalable border element (~~BE~~), wherein the scalable border element comprises:

a ~~BE~~ border element signaling entity providing ~~BE~~ border element signaling functions and in communication with a call control element ~~said GCE~~;

a first ~~BE~~ border element media entity providing ~~BE~~ border element media functions in communication with ~~said BE~~ the border element signaling entity and in communication with ~~said~~ the first user device; and

a second ~~BE~~ border element media entity providing ~~BE~~ border element media functions in communication with ~~said BE~~ the border element signaling entity, in communication with ~~said~~ the first ~~BE~~ border element media entity for media transfers and in communication with a second user device acting as a call destination device;

receiving in the ~~BE~~ border element signaling entity a signaling message from ~~said~~ the first user device to setup ~~[[a]]~~ the call;

communicating the signaling message from the ~~BE~~ border element signaling entity to ~~[[a]]~~ the call control element (~~GCE~~) that manages ~~the~~ a call flow process and determines a path to ~~a destination~~ the second user device and a second ~~BE~~ border element media entity associated with ~~said~~ the second user device;

opening pinholes for media streams;

connecting the said the first BE border element media entity to the second BE border element media entity for media transfers;

communicating between the CCE call control element and the second BE border element media entity to determine if transcoding is required and to determine if ~~[[it]]~~ the call control element is invoking the an appropriate BE border element media entity to provide the transcoding function; and

establishing the a call connection between the first user device initiating ~~the call~~ and the second user device.

17. (Currently Amended) The method of claim 16 ~~wherein the call connection may be terminated, the method further comprising~~ comprises:

communicating between said CCE the call control element and said BE the border element signaling entity entities when either one of: said the first user device ~~or said~~ and the second user device indicates it is ending the call; and

communicating a call termination from said CCE the call control element to said the first and the second BE border element media entities to close the pinholes thereby terminating the call.

18. (Currently Amended) The method of claim 16 wherein the call control element said CCE ~~that manages of the call flow process and determines the destination BE and its associated BE media entity further comprises:~~

~~communicating~~ communicates with a service broker to determine whether a service feature is required;

~~communicating~~ communicates with an application server to service the call; and

~~communicating~~ communicates with a media server to provide media stream functions ~~[[if]]~~ when required.

Claims 19. - 41. (Canceled)

42. (Currently Amended) A computer-readable medium encoded with computer executable instructions that when executed cause a computer system to perform call connection services between user devices using a decomposed border element (BE), made up of ~~at least one BE~~ a border element signaling entity and a plurality of ~~BE~~ border element media entities, between the user devices and the computer system, by performing steps of:

- connecting a first user device ~~for initiating a call~~ to a first ~~BE~~ border element media entity and to ~~a BE~~ the border element signaling entity;
- receiving in the ~~BE~~ border element signaling entity a signaling message from ~~[[a]]~~ the first user device to setup a call;
- communicating the signaling message from the ~~BE~~ border element signaling entity to a call control element (CCE) that manages ~~the~~ a call flow process and determines a path to a destination user device and a second ~~BE~~ border element media entity associated with the destination user device;
- opening pinholes for media streams;
- connecting the said first ~~BE~~ border element media entity to the second ~~BE~~ border element media entity for media transfers;
- communicating between the ~~CCE~~ call control element and the second ~~BE~~ border element media entity to determine if transcoding is required and if it is invoking the appropriate ~~BE~~ border element media entity to provide the transcoding function; and
- establishing a call connection between the first user device ~~initiating the call~~ and the destination user device.

43. (Currently Amended) The ~~computer-readable~~ computer-readable medium of claim 42 wherein the call connection ~~may be~~ is terminated, by further performing the steps of:

- communicating between said ~~CCE~~ the call control element and said ~~BE~~ the first and second border element signaling entities when either said one of: the first user device and the destination device indicates it is ending the call; and

communicating a call termination from said ~~CCE~~ the call control element to said the first and the second BE border element media entities to close the pinholes ~~thereby terminating the call~~.

44. (Currently Amended) The ~~computer-readable~~ computer-readable medium of claim 42 wherein said ~~CCE~~ that manages of the call flow process and determines the destination BE and its associated BE media entity by further performing the call control element further performs the steps of:

communicating with a service broker to determine whether a service feature is required;

communicating with an application server to service the call; and

communicating with a media server to provide media stream functions ~~[[if]]~~ when required.